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Chapter 2
Office and knowledge work

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'Innovative Learning Approaches for Implementation of Lean Thinking to Enhance Office and Knowledge Work Productivity'

ILA-LEAN Project No 2016-1-PL01-KA203-026293
2016-2018

2018

Project Title

Innovative Learning Approaches for Implementation of Lean Thinking to Enhance Office and Knowledge Work Productivity

Project Number: 2016-1-PL01-KA203-026293

Objective

The objective of this chapter is to introduce the concept of knowledge and office work, and how the lean approach can be applied.

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Content

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Chapter 2.1
Office and knowledge work definitions

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2.1. Office and knowledge work definition

- There is **no single accepted definition** to **office and knowledge work**

- **Knowledge work** have been defined by various researchers as follows:

  - The primary task is **managing information** (Drucker 1969)
  - Work based on **handling knowledge**, requiring deep understanding of the work content, and
  - **Knowledge is an important ingredient of output**. Knowledge work is typically collaborative in nature (Iivari & Linger 1999).
  - Focus is on **the ways of handling knowledge** (Davenport 2005, Pyöriä 2005).
  - Dynamic in nature. **Knowledge processes and their connections are invisible**. **Often** contains **design activities and exploration** (Staats et al. 2011).

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2.1. Office and knowledge work definition

Key focus on knowledge work definition	Authors
Primary task is managing information.	*Drucker 1969*
Work based on handling knowledge. Deep understanding of the work content. Knowledge is important ingredient of output. Collaborative in nature.	*Iivari & Linger 1999*
Ways of handling knowledge - process viewpoint	*Davenport 2005, Pyöriä 2005*
Dynamic in nature. Knowledge processes and their connections are invisible. Contains often design activities and exploration.	*Staats et al. 2011*

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Chapter 2.1.1
Office and knowledge work continuum

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2.1.1 Office and knowledge work continuum

Continuum of office and knowledge work		
Systematic, repeatable	**Level of routines**	Innovative
Standard	**Formal methods**	Not-standard
Low	**Personal expertise and personal judgement**	High
Apply	**Use of knowledge**	Create, Innovate
Helps to solve problem	**Knowledge as an output ingredient**	Main ingredient
Facts, techniques	**Type of knowledge**	Philosophies, visions
Low	**Complexity of task**	High
Low	**Role of collaboration/collaborative thinking**	High

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2.1.1 Office and knowledge work continuum

Basic office work

High level knowledge work

Basic office work	Continuum of Knowledge work	*High level knowledge work*
Systematic, repeatable	Level of routines	Innovative
Standard	Formal methods	Not-standard
Low	Personal expertise and personal judgement	High
Apply	Use of knowledge	Create, Innovate
Helps to solve problem	Knowledge as output ingredient	Main ingredient
Facts, techniques	Type of knowledge	Philosophies, visions
Low	Complexity of task	High
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Chapter 2.1.2
Office and knowledge work productivity dimensions

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2.1.2 Dimensions of Knowledge Work productivity

Dimension of KW Productivity	Approach	Author
Task	Assessing what the task is	Drucker (1999)
Role of worker	Self-management and autonomy, continuing innovation, continuous learning	
Output	Quality of output	
Management	Knowledge worker is an asset	

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2.1.2 Dimensions of Knowledge Work productivity

Dimension of KW Productivity	Approach	Author
Task	Accounting for outputs and outcomes	Ramirez & Nembhard (2004)
Role of worker	Doing things right; meeting the task standards	
Output	Level of the quality of the work	
Management	Doing the right things and important tasks	

Adapted from Kropsu-Vehkaperä, H & Isoherranen (2018)

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2.1.2 Dimensions of Knowledge Work productivity

- The productivity challenges for Office and Knowledge work come mainly from 3 types of challenges
  - Overload (Muri)
  - Variation (Mura)
  - Wastes (Muda)

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2.1.2 Dimensions of Knowledge Work productivity

- Overload in Office and Knowledge work means that there is a continuous overflow of tasks and activities
  - i.e. an office worker cannot perform the tasks of the required quality and timelines.
    - Typically, this is visible in multitasking various of activities and projects
    - This can cause sick leaves, preventing the capability for renewal and learning.

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2.1.2 Dimensions of Knowledge Work productivity

- Variation in Office and Knowledge work means that there is;
  - e.g. a variation between different days for workload or that the ways of working are variating depending on the day.
    - This means that the processes are not stable and cannot be systematically developed

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Chapter 2.2
Wastes in office and knowledge work

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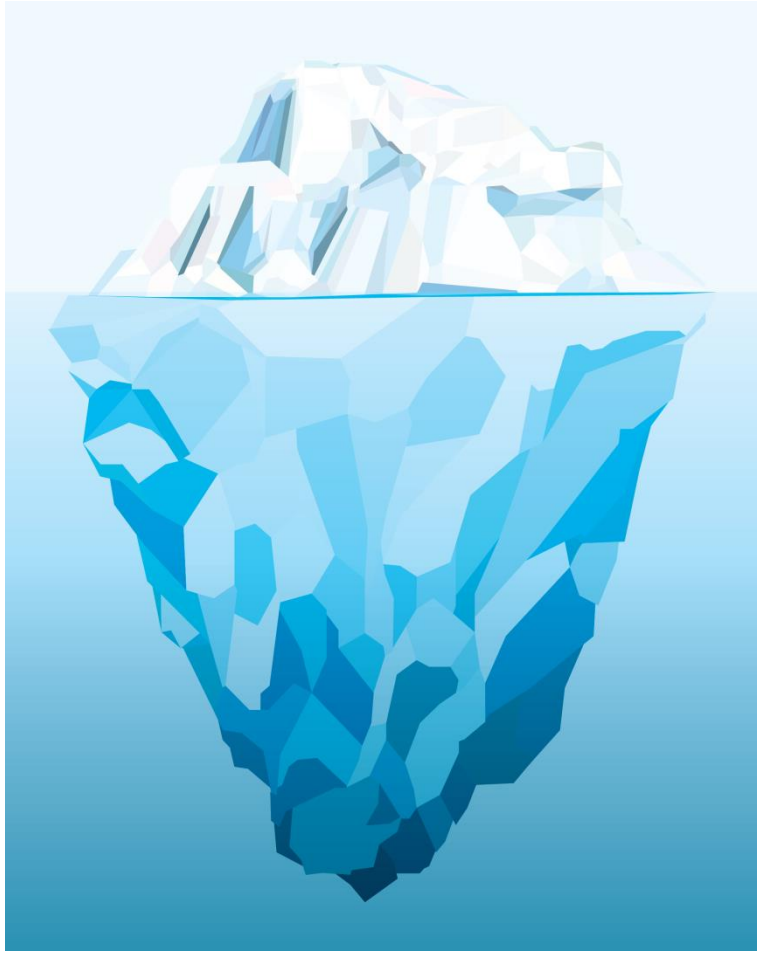
2.2. Wastes in office and knowledge work



WASTE IS HIDDEN

" Waste is hidden.
Do not hide it.
Make problems visible. –
7° Ohno's Precepts".

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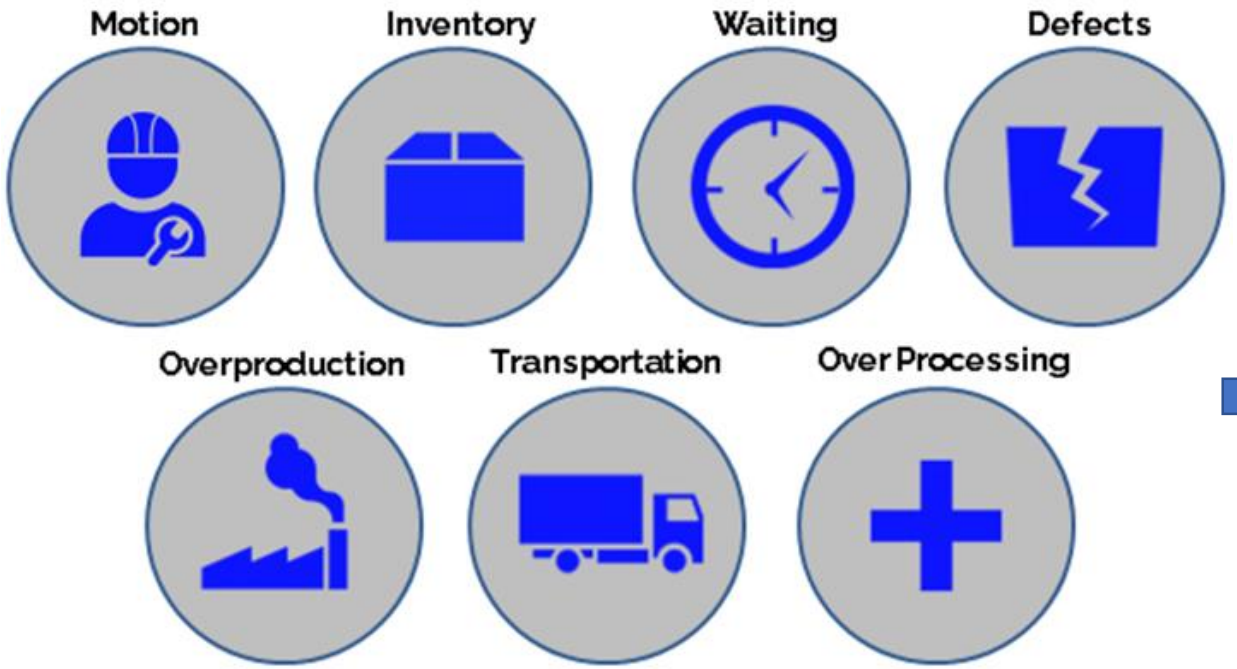
2.2. Wastes in office and knowledge work

THE 7+1 WASTE



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2.2. Wastes in office and knowledge work

7 wastes of production	Description
Overproduction	Producing items earlier or in greater quantities than needed by the customer. Producing earlier or more than it is needed generates other wastes, such as overstaffing, storage, and transportation costs because of an excess inventory. An inventory can be a physical inventory or a line of information.
Waiting	Workers merely serve as watch people for an automated machine, or have to stand around waiting for the next processing step, tool, supply, part, etc., or just plain having no work because of no stock, lot processing delays, equipment downtime or capacity bottlenecks.
Inventory (Work in process, WIP)	Excess raw material, WIP, or finished goods causing longer lead times, obsolescence, damaged goods, transportation and storage costs or delays. Moreover, extra inventories hide problems such as production imbalances, late deliveries from suppliers, defects, equipment downtime or long setup times.
Over-processing	Taking unneeded steps to process the parts. Inefficiently processing due to poor tool and product design, causing unnecessary motion and producing defects. Waste is generated when providing higher quality products than is necessary. At times extra “work” is done to fill excess time rather than spending it on waiting.
Transportation	Moving work in process (WIP) from place to place in a process, even if it is only a short distance.,or having to move materials, parts, or finished goods into or out of storage or between processes.
Motion	Any motion employees have to perform during the course of their work other than adding value to the part, such as reaching for, looking for, or stacking parts, tools, etc. Walking is also a waste.
Defects	Production of defective parts or correction. Repairing of rework, scrap, replacement production, and inspection means wasteful handling, time or effort.
Plus 1 more	
Under-utilizing people	Losing time, ideas, skills, improvements, and learning opportunities by not engaging or listening to your employees.

Waste (Muda)

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2.2 Wastes in office and knowledge work
Practical examples!

- The **overproduction** in office and knowledge work can mean that work is done to early or too much

For example:

- Reports that nobody will read
- Unnecessary meetings or phone conferences
- Meeting minutes that nobody reads
- Distribution of documents, files or other attachments to large group without relevance
- Duplication of information, e.g. reporting the same issues to various reports and systems

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2.2 Wastes in office and knowledge work
Practical examples!

- The **waiting** in office and knowledge work can mean that the worker needs to wait without being able to proceed with the work

For example:

- Customer is waiting for service
- Worker is waiting for approval to proceed
- Meeting starts late – somebody arrives late, others wait
- Waiting for a reply from a co-worker or a customer
- IT-Systems waiting times
- Multitasking
- Interruptions

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2.2 Wastes in office and knowledge work
Practical examples!

- **Inventory** in office and knowledge work may mean that the worker has many work-in-process (WIP) items, e.g. multitasking between projects and tasks.

For example:

- If you have 4 projects or tasks to be done, while you are working on one project, 3 other projects are waiting
- Too much workload or projects at the same time

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2.2 Wastes in office and knowledge work
Practical examples!

- **Over-processing** in office and knowledge work may mean that there is unnecessary work that a customer is not willing to pay for

For example:

- Unnecessary reporting
- Multiple signatures and reviews
- Various stakeholders and decisions
- Overlapping reporting and communication

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2.2 Wastes in office and knowledge work
Practical examples!

- The **Transportation** in office and knowledge work may mean that there is ***unnecessary movement***.

For example:

- Unnecessary movement of a product
- Multiple handovers and sign-offs
- Illogical process flow and process loops

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2.2 Wastes in office and knowledge work
Practical examples!

- **Motion** in office and knowledge work can mean that there is unnecessary movement in the work.

For example:

- Multiple applications and systems which need multitasking and frequent application switching.
- Looking for people or materials, no standard places.
- Unnecessary meetings – e.g. in other campuses, buildings.

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2.2 Wastes in office and knowledge work
Practical examples!

- **Defects** in office and knowledge work may mean that there is unnecessary work on fixing issues or re-doing the work.

For example:

- Wrong orders or planning or billing
- Lost or broken items
- Lack of communication
- Insufficient communication

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2.2 Wastes in office and knowledge work
Practical examples!

- The **Underutilizing people** in office and knowledge work can mean that the full potential and skills of the workers are no utilized.

For example:

- There is no continuous improvement culture
- There are no trainings or coaching for employees
- There is not enough challenge at work – people are bored
- Achievement is not rewarded

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Learning summary

- Due to the nature of Office and Knowledge work these tasks cannot be easily defined, the work is in continuum and many tasks have both characteristics.
- The Lean implementation should take into this – adaptation is needed for the lean implementation
- Wastes should be discussed and visualized to get the improvement activities ongoing

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2.2.1 Lean in Office and knowledge work: previous research

Year	Author	Article title	Field of study
2015	Monteiro, M.F., Pacheco, C.C., Dinis-Carvalho, J. and Paiva, F.C.,	Implementing lean office: A successful case in public sector. FME Transactions, 43(4), pp.303-310.	
2016	Rachman & Ratnayake	Implementation of lean knowledge work in oil and gas industry - A case study from a Risk-Based Inspection project	engineering service (consultancy)
2015	McDermott & Venditti	Implementing lean in knowledge work: Implications from a study of the hospital discharge planning process	healthcare
2015	Power & Conboy	A Metric-Based Approach to Managing Architecture-Related Impediments in Product Development Flow: An Industry Case Study from Cisco	Product development
2014	Kruger	Lean implementation in the Gauteng public health sector	healthcare
2013	Toussaint & Berry	The promise of lean in healthcare	healthcare
2011	Staats & Upton	Lean knowledge work	IT services/engineering
2011	Staats, Brunner & Upton	Lean principles, learning, and knowledge work: Evidence from a software services provider	SW design / general perspective
2005	May	Lean thinking for knowledge work	General - philosophy

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2.2.1
Lean approach and principles in Knowledge Work

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Lean principles and methods	Source
Respect people **Engage the managers**	Toussaint & Berry (2013) Staats & Upton (2011)
Value creation **Value Stream Mapping (VSM)** **CTQ - Critical To Quality**	Toussaint & Berry (2013); May 2005 Toussaint & Berry (2013); Rachman & Ratnayake (2016); McDermott & Venditti (2015); Kruger (2014); Staats et al. (2011) Kruger (2014)
Create flow **Simplify process architecture** **Kanban** **Eliminating Wastes** **Kaizen blitz** **5 Why** **PCE - Process Cycle Efficiency** **A3**	Power & Conboy (2015); May (2005) Staats et al. (2011) Power & Conboy (2015) Rachman & Ratnayake (2016); Kruger (2014); Staats & Upton (2011); McDermott & Venditti (2015) Kruger (2014); Staats & Upton (2011) Rachman & Ratnayake (2016) Toussaint & Berry (2013)
Communication **Visualization: Visual control/tracking**	Staats & Upton (2011); Staats et al. (2011) McDermott & Venditti (2015); Toussaint & Berry (2013); Staats et al. (2011)
Work standardization (spaghetti diagrams) **Specify the work** **5S, standard codes and test cases** **Lean six-sigma** **Heijunka**	Toussaint & Berry (2013) McDermott & Venditti (2015) Staats & Upton (2011), Staats et al. (2011) Staats et al. (2011) Kruger (2014) Staats et al. (2011)
Continuous improvement (PDCA, DMAIC, hypothesis-driven problem solving)	Kruger (2014); Toussaint & Berry (2013); Staats & Upton (2011); Staats et al. (2011); May (2005)

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